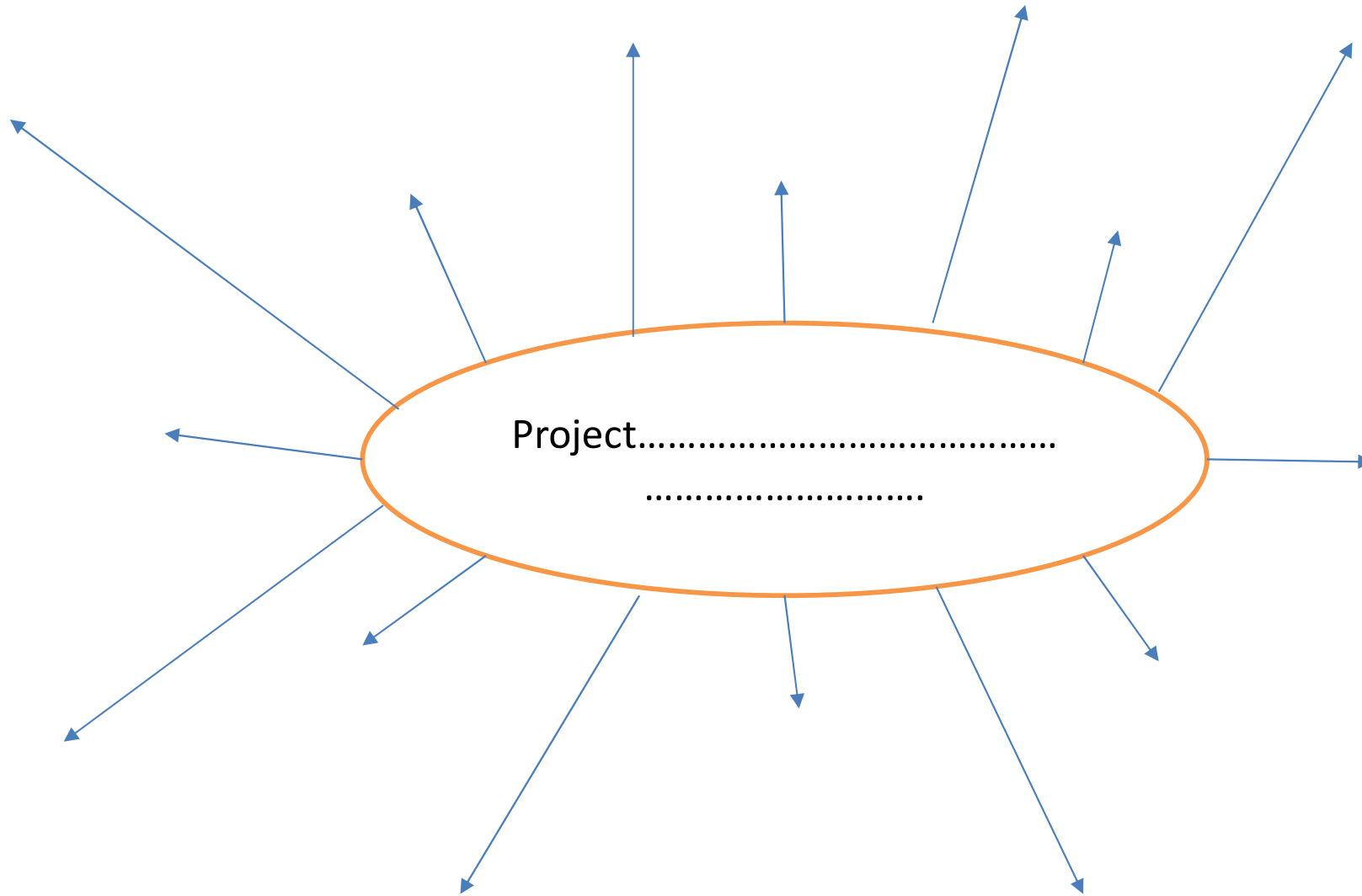




Year 9
Technology
Student
Workbook
(Numeracy
Edition)

NAME

Brainstorm Ideas the main things I will be looking at when making this project (explain the key attributes)



Crazy things are happening in this workshop. Circle the main safety hazards in a bright colour.

Complete "To avoid accidents" explain what students should actually be doing to remain safe?

SAFETY IN THE WORKSHOP



Students should always make sure they:

1) Don't drink in the workshop.

2)

3)

4)

5)

6)

7)

8)

9)

10)

To avoid an accident in the future I must

.....

MANAGING SELF

Level 4

Level 5

Year 9

Year 9

Not Achieved

Achieved

Merit

Excellence

- The students has not identified safety concerns in the poster.
- The student has used colour/ identification on the poster.

- The student has identified the 3 main safety concerns in the poster and added some colour.
- The student has identified some safety concerns and written a sentence explaining the actions to take to avoid an accident in the workshop.

- The student has identified the 5 main safety concerns in the poster and added some colour
- The student has numbered the safety concerns and written a sentence explaining the actions to take to avoid an accident in the future.

- The student has identified 8 safety concerns in the poster and has rendered the drawing well
- The student has numbered the safety concerns from 1 to 8.
- The student has written a detailed sentence explaining the actions to take to avoid an accident in the future.

WOODWORKING TOOLS- Identification

TASK

- You are to draw the tools in the toolbox in the workshop and write next to them how they are used or what and how to use it.
- The first one has been done for you as in Fig 1.

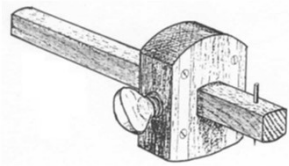


Fig 1

The marking gauge uses a sharp point to mark the work parallel to the face.



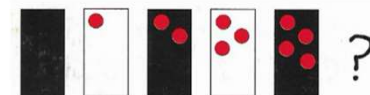
Quick Fact

Sequences

A sequence is a set of things that are in order and follow a particular pattern or rule.



The terms in this sequence are shapes. Each term has one more side than the one before it. The next term will be a shape with 6 sides.



These pictures follow two sequences. The next term will be a white shape with 5 red spots on it.

Woodworking tools

TECHNOLOGICAL PRODUCTS

Level 4

Level 4

Year 9

Year 9

achieved

Achieved

Merit

Excellence

The student has identified some tools correctly and demonstrated their use correctly.

- *The student has identified a range of tools correctly and operated them safely.*
- *The student has explained how they have manipulated their materials to enable them to produce a product.*

- *The student has identified a range of tools correctly and operated them correctly and safely.*
- *The student has explained how they have manipulated their materials to enable them to produce a product.*

- *The student has identified a large range of tools correctly and operated them skilfully and safely.*
- *The student has explained in detail how they have manipulated their materials to enable them to produce a product.*

Power Tools and Machines in the workshop

Name the following and give its use



DESIGN BRIEF

Brief: Explain what are you designing? What will it do?

Specifications: (what the design should have)

- Eg: Be well made so no pieces fall off, have no sharp edges
- -
- -
- -
- -
- -

Find the meaning of these words

1. Ergonomics-.....-
.....
.....
2. Aesthetics-
.....
.....

Task

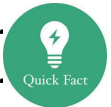
Highlight the key words in the design brief.

Why is it a good idea to look for the keywords in the design brief.

.....
.....
.....

What are some of the important points that you have identified in the making of your product from the brief?

.....
.....
.....
.....
.....
.....
.....
.....

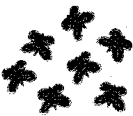


Equivalent fractions

If the numerator and denominator are the same, the fraction is equivalent to a "whole one". Depending what you are looking at, this "whole one" might be the number 1, a whole thing, or a whole group of things.

$$\frac{4}{4} = 1$$

$\frac{6}{6}$ of this shape is equal to the whole shape.



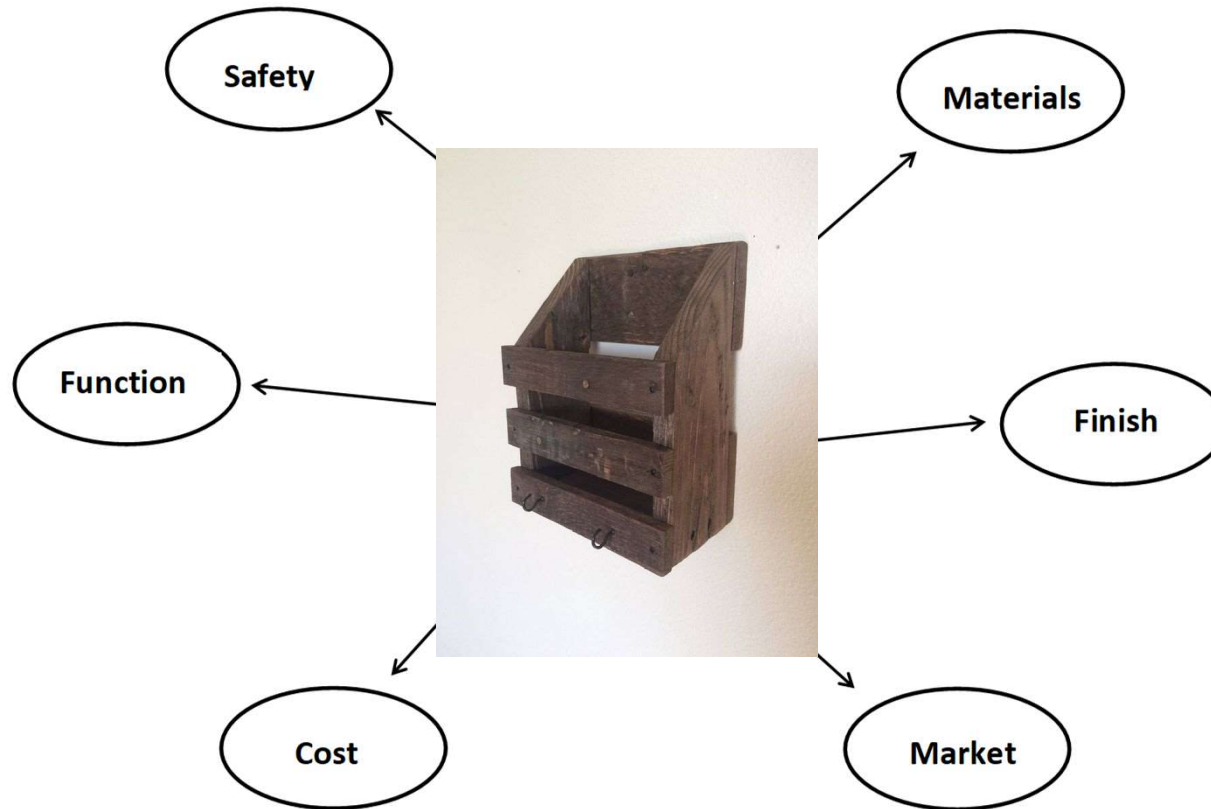
$\frac{7}{7}$ of these butterflies are pink, so the whole group of butterflies is pink.

ANALYSING a PRODUCT

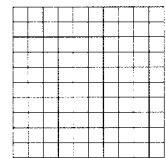
Product Design Criteria

TASK

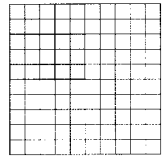
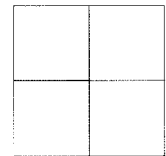
- I will use a mind map to help me gain a better understanding of what is required, available and needed to design and make my Product
- Under each heading complete the mind map identifying as many suitable elements to help aid the design process.



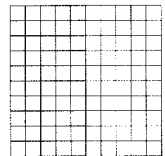
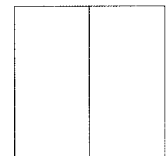
Percentages



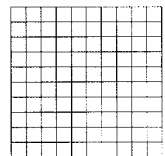
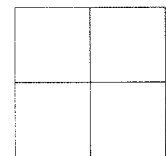
There are 100 squares on this grid. 1 is blue, so you can say that 1% of the squares is blue.



$\frac{1}{4}$ of the shape is blue, so 25% of it is blue.



$\frac{1}{2}$ of the shape is blue, so 50% of it is blue.



$\frac{3}{4}$ of the shape is blue, so 75% of it is blue.

STAKEHOLDER QUESTIONNAIRE

TASK

- Here are some identifiable features that your product could have.
- You will need to talk to your stakeholder to ask what features they may like for their product.

Some features my stakeholder may like;

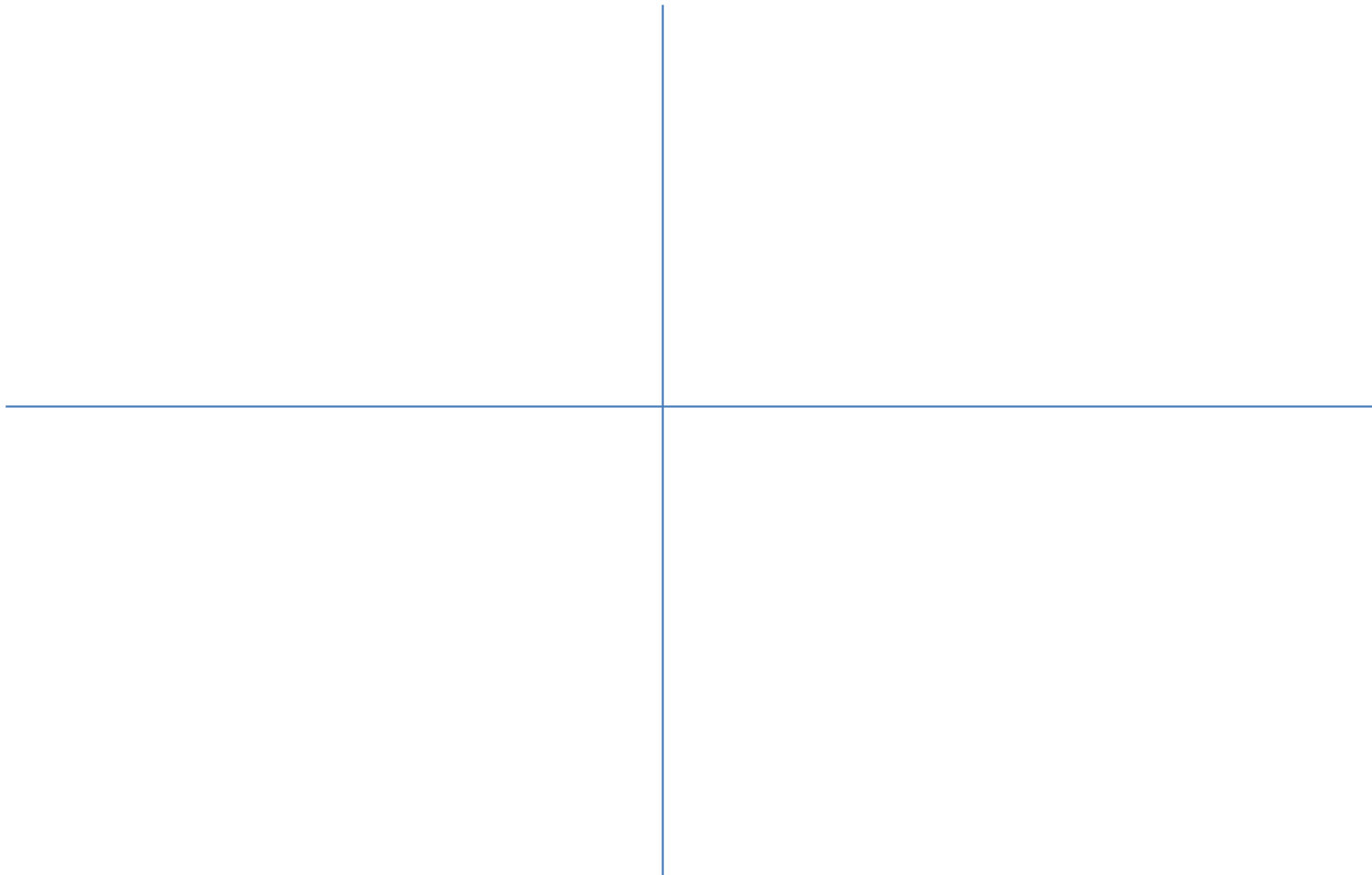


1.
2.
3.
4.
5.
6.
7.

| MANAGING SELF | | | |
|--|---|---|--|
| Level 4 | | Level 5 | |
| Year 9 | | Year 9 | |
| Not achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> • The student has not spoken to the stakeholder. • The student has not asked what designs would look nice. • The student has not listed some points of the design. | <ul style="list-style-type: none"> • The student has spoken to the stakeholder and knows some design features that the stakeholder wants. • The student has asked what design would enhance the look of the Stool. • The student has listed some important points of the design. • The student has asked if the stakeholder is happy with the design. | <ul style="list-style-type: none"> • The student has spoken to the stakeholder and knows some design features that the stakeholder wants. • The student has asked in detail what designs would enhance the look of the Stool. • The student has ranked the important points of the design. • The student has asked if any additional features would like to be added. | <ul style="list-style-type: none"> • The student has spoken to the stakeholder and knows some design features in detail that the stakeholder would like. • The student has asked in detail what design would enhance the look of the Stool. • The student has ranked the important points of the design in order of priority. • The student has asked if any additional features would like to be added to aid function. |

Research - Existing products analysis

Collect at least **4 images** of similar products that you would like to design and analyse the product using (PMI) P- what you like.....M- what you don't like.....I- interesting idea that you might use.



Shape & Space Words

Parallel lines

Parallel lines are the same distance apart all the way along. They never meet, no matter how long they are.

These lines are parallel.



On diagrams, arrows like these show that lines are parallel.



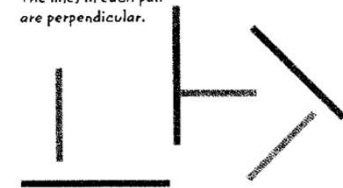
Parallel lines can be straight or curved.



Perpendicular lines

Lines that are perpendicular are at right angles to each other. Lines don't have to touch to be perpendicular.

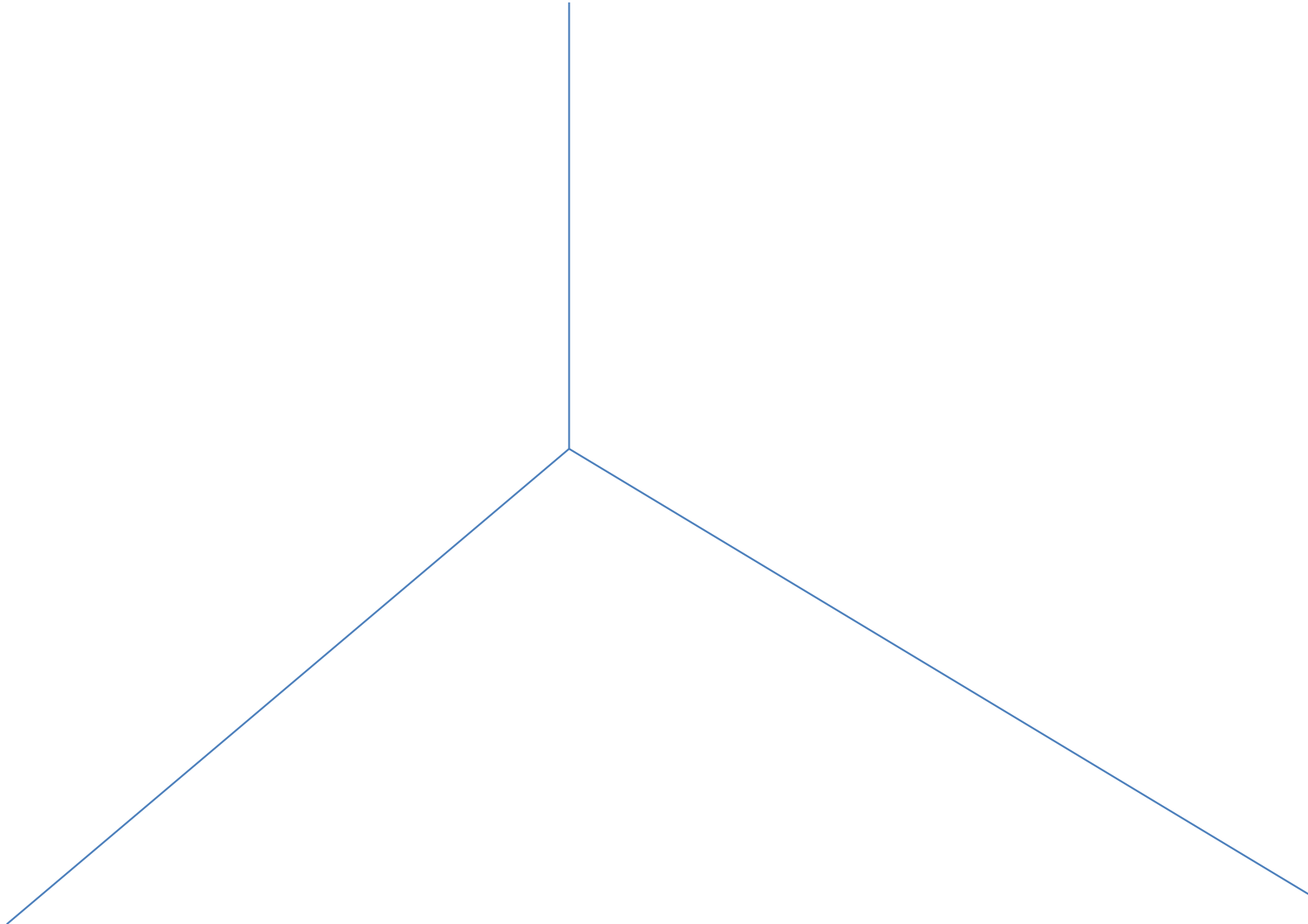
The lines in each pair are perpendicular.



Each purple line is perpendicular to its green line, and each green line is perpendicular to its purple one.

Initial ideas

Draw your ideas with lots of details. **(Minimum of 3 different ideas)** Ensure ideas meet attributes and client requirements. Explain your ideas fully.



Design Development

Choose the **best idea** or parts of the idea and feedback from the client and start to draw and develop all aspects of the design with more detail, how it can be constructed? What would be good material, specific sizes. Etc. You must show evidence of any testing done.

TASK

You are to complete the table opposite; you will need to manage your time wisely to be able to complete your project on time.

You have been given 30 lessons to design and make your project.

Below are examples of ways you could manage your time to complete the tasks.

TIME MANAGEMENT

| WEEK | Period | Period | Period |
|------|---------------|---------------|---------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4-9 | <i>Making</i> | <i>Making</i> | <i>Making</i> |
| 10 | | | |

| Activity/Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|
| Cut fur | | | | | | | | | | | | | |
| Stuff and sew fur | | | | | | | | | | | | | |
| Cut material | | | | | | | | | | | | | |
| Sew clothes | | | | | | | | | | | | | |
| Embroider T-shirt | | | | | | | | | | | | | |
| Cut accessories | | | | | | | | | | | | | |
| Sew accessories | | | | | | | | | | | | | |
| Dress bears | | | | | | | | | | | | | |
| Package bears | | | | | | | | | | | | | |
| Ship bears | | | | | | | | | | | | | |

Lot size: 100 bears
 All activities are scheduled to begin at their earliest start time.
 ■ Completed work
 ■ Work to be completed



Considerations needed during the making process

.....

.....

.....

.....

.....

.....

| PLANNING FOR PRACTICE | | | |
|--|---|---|--|
| Level 4 | | Level 4 | |
| Year 9 | | Year 9 | |
| Not Achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> The student has not used the gantt chart supplied to help aid the completion of their project. | <ul style="list-style-type: none"> The student has used the gantt chart supplied to help aid the completion of their project. The student has identified key stages and the importance they will play in completing the task effectively. | <ul style="list-style-type: none"> The student has used the gantt chart supplied to help aid the completion of their project. The student has identified key stages and the importance they will play in completing the task effectively. The student has identified resources needed to complete the project. | <ul style="list-style-type: none"> The student has used the gantt chart supplied to help aid the completion of their project. The student has identified key stages and the importance they will play in completing the task effectively. The student has identified resources needed to complete the project. The student has identified and set review points. |

MAKING PLAN—A step-by-step explanation on how the product is made to from start till the finished product.

| | | | |
|--|--|--|--|
| | | | |
| | | | |

| PLANNING FOR PRACTICE | | | |
|---|---|--|--|
| Level 4 | Level 4 | | |
| Year 9 | | Year 9 | |
| Not Achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> • <i>The student has not completed a making plan to help aid the completion of their project.</i> | <ul style="list-style-type: none"> • <i>The student has completed a making plan to help aid the completion of their project.</i> • <i>The student has identified key stages and the importance they will play in completing the task effectively.</i> | <ul style="list-style-type: none"> • <i>The student has completed a making plan to help aid the completion of their project.</i> • <i>The student has identified key stages and the importance they will play in completing the task effectively.</i> • <i>The student has identified resources needed to complete the project.</i> | <ul style="list-style-type: none"> • <i>The student has completed a making plan to help aid the completion of their project.</i> • <i>The student has identified key stages and the importance they will play in completing the task effectively.</i> • <i>The student has identified resources needed to complete the project.</i> • <i>The student has identified and set review points.</i> |

DRAWING PRESENTATION

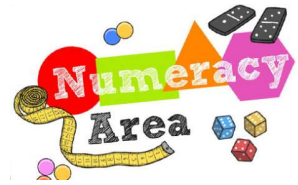
TASK

- *You are required to produce an image of your finished Product.*
- *Draw your product as a 3D image.*
- *Colour and texture will need to be added.*
- *Make your drawing as large as possible.*
- *A decision also needs to be made about the material and style of your product.*



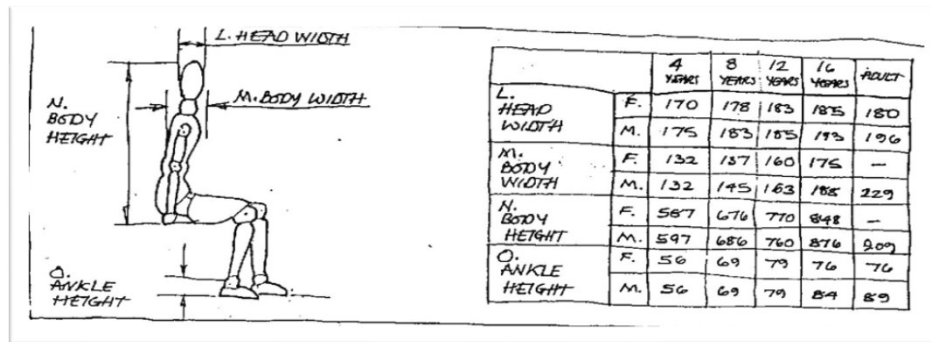
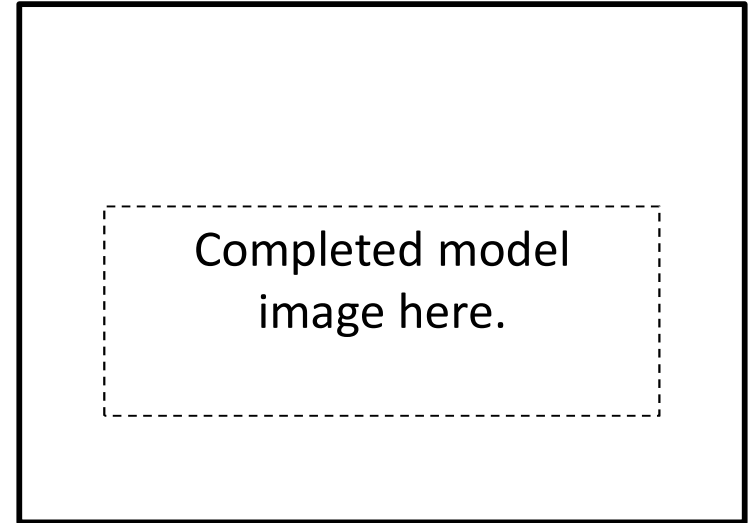
| OUTCOME DEVELOPMENT | | | |
|---|---|---|---|
| Level 4 | | Level 4 | |
| Year 9 | | Year 9 | |
| Achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> • <i>The student has not drawn a pencil sketch in 2D.</i> | <ul style="list-style-type: none"> • <i>The student has drawn a basic 3D shape.</i> • <i>The student has added basic colour to their drawing.</i> | <ul style="list-style-type: none"> • <i>The student has made an honest attempt to convey their chosen idea.</i> • <i>The student has produced a well-designed Stool.</i> • <i>The student has added colour to their drawing to enhance the materials being used.</i> | <ul style="list-style-type: none"> • <i>The student has produced a well-designed Stool.</i> • <i>The student has drawn a detailed 3 dimensional drawing in proportion.</i> • <i>The student has added the grain structure to their drawing</i> • <i>The student has added colour and rendered their drawing well.</i> |

DESIGN FUNCTION



TASK

- You need to consult with your stakeholder as you need to make the product to the correct size.
- With the aid of the table below you are to construct a model to test your design.
- You are to think about scale when constructing your model.



Stakeholder feedback

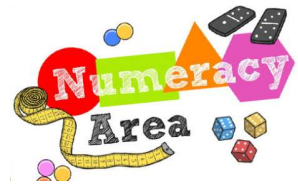
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| TECHNOLOGICAL MODELLING | | | |
|---|---|--|---|
| Level 4 | Level 4 | | |
| Year 9 | | Year 9 | |
| Achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> The student has not completed the modelling task. | <ul style="list-style-type: none"> The student has completed the modelling task. The student has identified the suitability of their Stool. | <ul style="list-style-type: none"> The student has completed the modelling task. The student has identified the suitability of the graphic design for the Stool. The student has described what should be done when making decisions. | <ul style="list-style-type: none"> The student has completed the modelling task. The student has identified the suitability of their Stool. The student has described in detail what should be conveyed when making decisions. |

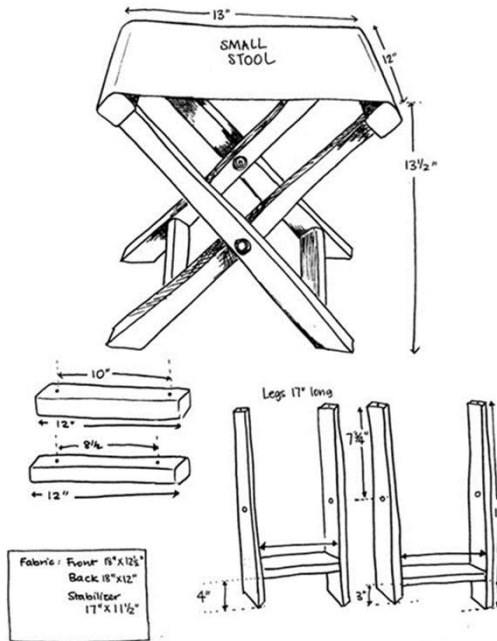
Working Drawings



Below shows an example of a Stool frame with measurements.

TASK

- Draw how your Product and joints could be constructed with measurements.



OUTCOME DEVELOPMENT

Level 4

Level 4

Year 9

Year 9

Not Achieved

Achieved

Merit

Excellence

- The student has not drawn a simple 2 D drawing with little detail as to how the Stool will be constructed

- The student has identified a construction method and has drawn the Stool in 2D.

- The student has identified a range of construction methods and has drawn the Stool in 3D.
- The student has shown detail with their idea and has either used oblique, isometric or 2 point perspective to help convey their design ideas.

- The student has identified a range of methods of construction that conforms to industry standards and which shows hidden detail where needed.
- The student has conveyed their ideas using 2 orthographic methods in detail and it is drawn to scale and is well presented.

MATERIALS AND THEIR USAGE

Below is a guideline as to some of the different types of materials available.

TASK

You are to consider the alternatives available and the stake holders needs and make a decision as to what would be a suitable material to make the seat of your stool from.

Materials and Their Properties
I materiali e le loro proprietà



Metal

- Found in the ground, sometimes mixed in with rocks.
- Strong, hard, shiny, malleable (they can be hammered into a different shape without breaking and they can be stretched out into wires).
- Iron and steel** are magnetic. Other metals are not magnetic.

Some metals are good electrical and thermal (heat) conductors.

Fabric

- Made of fibres woven together.
- Some fabrics are natural (the fibre comes from living things), e.g. wool, silk, cotton.
- Natural fabrics are quite expensive.
- Of natural fabrics, wool gives warmth and cotton is cool and absorbent (it soaks up liquids).
- Some fabrics are man-made, e.g. polyester, nylons.
- Man-made fabrics are usually easy to wash and dry and are hard-wearing.

Rock

- The raw material of the Earth. They are underground, on beaches, in soil.
- Some rocks are hard, e.g. granite.
- Some rocks are soft, e.g. chalk.
- Some rocks are impermeable to water (they do not allow water to go through), e.g. slate.

Some rocks are permeable to water (they allow water to go through), e.g. sandstone.

Plastic

- Made from oil.
- Strong, can be made into any shape.
- Not magnetic.
- Good electrical and thermal insulators.
- Can be coloured.

Can be transparent, translucent or opaque.

Pottery

- Made from clay which is first shaped and then heated.
- Strong, but glazed pottery can shatter.
- Usually opaque.

Can be made into objects that have different shapes.

Wood

- Comes from trees.
- Strong, flexible and long lasting.
- An electrical and thermal insulator.

Used to make paper.

Glass

- Made from heating sand and chemicals together.
- Strong, but can shatter.
- Usually transparent.

Can be made into objects with different shapes.

Conclusion

I will be making my product out of because

.....

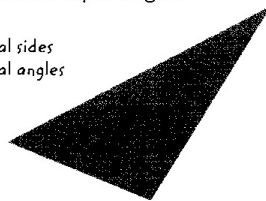


Triangles

Scalene triangles

A scalene triangle has no equal sides and no equal angles.

No equal sides
No equal angles

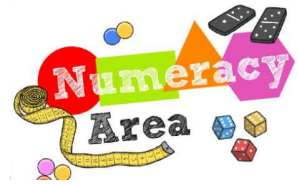


Scalene triangles can be right-angled, like this one, but they don't have to be.

TASK

- Below is an example of a cutting list for a tray.
- You are required to complete a cutting list for your Product.
- Complete the measurement table.

CUTTING LIST



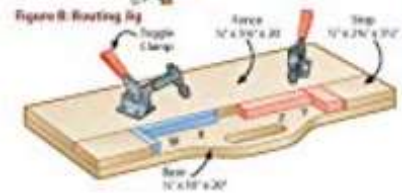
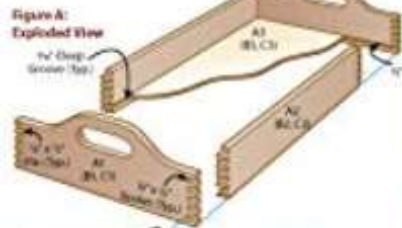
Materials:

- 18 linear ft. of 3/4-in.-thick x 5-in.-wide hardwood lumber
- One-quarter sheet 1/4-in. hardwood plywood
- One-half sheet 1/4-in. Baltic birch plywood (for ggs)
- Wood glue

Tools:

Table saw, table set, router table, #8 pins, jig saw, 3-in.-dia. and 1/4-in.-dia. sanding drums, 1-in.-dia. and 1/4-in.-dia. Forstner bits, 1/4-in. 5/8-in. router bit with top-mounted bearing block plane, assorted clamps

Cost: About \$60



| Cutting List | | | |
|-------------------------------------|----------------------|------|-------------------------|
| Overall Dimensions: 41" x 21" x 21" | | | |
| Part | Name | Qty. | Dimensions |
| Large Tray | | | |
| A1 | End | 2 | 14 1/2" x 17" |
| A2 | Side | 2 | 17" x 21" x 21" |
| A3 | Bottom* | 1 | 17" x 17 1/2" x 17 1/2" |
| Medium Tray | | | |
| B1 | End | 2 | 21" x 17 1/2" x 18 1/2" |
| B2 | Side | 2 | 17" x 21" x 18 1/2" |
| B3 | Bottom* | 1 | 17" x 17 1/2" x 18 1/2" |
| Small Tray | | | |
| C1 | End | 2 | 17" x 17 1/2" x 17 1/2" |
| C2 | Side | 2 | 17" x 17 1/2" x 17 1/2" |
| C3 | Bottom* | 1 | 17" x 17 1/2" x 17 1/2" |
| D | Plug | 12 | Custom fit |
| Bearing Rig | | | |
| W | Medium end spacer | 2 | 17" x 17" x 21" |
| X | Medium bottom spacer | 1 | 17" x 17" x 17 1/2" |
| Y | Small end spacer | 2 | 17" x 17" x 21" |
| Z | Small bottom spacer | 1 | 17" x 17" x 17 1/2" |

* Plywood

| Measurements in Millimetres | | | | | |
|-----------------------------|----------|----------|--------|-------|-----------|
| Parts | Material | Quantity | Length | Width | Thickness |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Product - EVALUATION

Does it do the job it was intended for? Explain what it was intended for?

Has it met the requirements of the brief? How?

Did you select the appropriate materials and finish? What were they?

Did you develop your idea enough? How?

Did the research help you? How?

Did you use your time well? Explain

Describe what you know now from completing the project that you did not know before?



Good points-

Bad points-

What changes/improvements you will make next time ?

Stakeholder feedback

.....

.....

.....

| OUTCOME DEVELOPMENT | | | |
|--|--|--|---|
| Level 4 | | Level 4 | |
| Year 9 | | Year 9 | |
| NOT Achieved | Achieved | Merit | Excellence |
| <ul style="list-style-type: none"> The student has not produced an outcome that fulfils the brief | <ul style="list-style-type: none"> The student has produced an outcome that fulfils the brief The student has described some design ideas that have benefited the outcome. | <ul style="list-style-type: none"> The student has produced an outcome that fulfils the brief The student has described some design ideas that have benefited the outcome.. The student has trailed the prototype now that it is completed. | <ul style="list-style-type: none"> The student has produced an outcome that fulfils the brief The student has described some design ideas that have benefited the outcome.. The student has trailed the prototype when completed. The student has evaluated the outcome against the key attributes. |